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Teacher training in Portugal for the educational care of gifted students

Alberto Rocha[1+]
Ana Aguiar[2]
Ramon Garcia-Perales[3]
Ana Isabel Silva Almeida[4]

[1]*Superior Institute of Educational Sciences of the Douro (ISCE Douro), Portugal; Center for Research in Education (CIEd), University of Minho, Portugal.*
[1]*Email: alberto.rocha@iscedouro.pt*
[2]*Polytechnic Institute of Viana do Castelo, ESE-IPVC, Portugal.*
[2]*Email: anaaguiar@ese.ipvc.pt*
[3]*University of Castilla-La Mancha, UCLM, Spain.*
[3]*Email: Ramon.GarciaPerales@uclm.es*
[4]*National Association for the Study and Intervention in Giftedness (ANEIS, Portugal) and University of Castilla-La Mancha, UCLM, Spain.*
[4]*Email: AnaIsabel.Silva1@alu.uclm.es*

(+ Corresponding author)

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ABSTRACT

The current Portuguese educational context highlights the importance of including gifted students by developing and implementing specific educational policies and practices. Recognizing that teacher preparedness is crucial to achieving this goal, this study examines the extent and impact of teacher training in Portugal in relation to the needs of gifted learners. Quantitative data were collected via a structured questionnaire administered to 863 Portuguese teachers from various educational levels and regions using stratified sampling to ensure representativeness. Statistical analysis indicated a positive association between specific training in giftedness and more effective pedagogical practices, greater use of differentiated instruction, and increased ability to adapt learning environments for high-potential students. Conversely, a lack of training in giftedness was related to significant limitations in teachers' abilities to fully integrate gifted students into mainstream education and nurture their academic and socio-emotional development. The findings underscore the urgent need to reinforce initial and ongoing teacher training programs by incorporating content on identifying gifted students, understanding their characteristics, and implementing effective pedagogical strategies. Additionally, policies should promote professional development opportunities, collaborative networks, and access to specialized resources. This would enable teachers to design and implement tailored strategies to enhance gifted students' learning potential. This study provides new empirical evidence in the Portuguese context and offers insights that may inform national and international policy frameworks. The implications extend beyond gifted education to contribute to broader discussions on equity, excellence, and optimizing educational resources.

Contribution/Originality: This study contributes to the existing literature by providing the first large-scale empirical analysis of Portuguese teachers' training on gifted education, integrating legislation, conceptualization, identification, and intervention. It highlights the impact of specific training on pedagogical practices and offers evidence-based insights to inform inclusive educational policies nationally and internationally.

1. INTRODUCTION

In today's educational landscape, schools must pay particular attention to inclusion, reflecting the diversity evident among both students and teachers (Rocha et al., 2022). This reality requires a legislative basis to guide educational policies and practices aimed at inclusion. At the same time, ongoing training programs must be developed

for teachers both working teachers and those in training in response to the challenges that inclusive education poses for them and their schools. These training programs should be comprehensive and adapted to teachers' specific needs, promoting the acquisition of skills and pedagogical strategies that encourage effective inclusion for all students.

However, the priority given to inclusion is especially pressing in the context of gifted students, who demonstrate superior performance in specific areas of development, exhibiting not only above-average skills and exceptional creativity but also consistent, deep engagement with their tasks Renzulli (2016) and Renzulli (2018). Recognizing and cultivating these qualities requires an educational approach that extends beyond merely enlarging the conventional curriculum, instead focusing on exploiting individual potential and fostering an environment that stimulates critical thinking, innovation, and autonomy. This approach prepares young people to face complex challenges and contribute meaningfully to society (Ziegler, Balestrini, & Stoeger, 2018). To that end, educators must be equipped with a variety of pedagogical strategies, and educational institutions must invest in resources and training that enable teachers to identify and develop these students' potential, ensuring that their specific needs are fully met and appreciated.

Gifted students manifest particular needs and face specific challenges that can emerge in a classroom environment (García-Martínez, Gutiérrez Cáceres, Luque de La Rosa, & León, 2021). This requires careful attention, suitable pedagogical strategies, and educational guidelines tailored to their particular situation (Da Costa & De Araújo, 2021; Ezzani, Mun, & Lee, 2021) to ensure that everyone receives an inclusive, quality education capable of meeting their needs, promoting well-being and psychological adjustment (Al-Hamdan, Al-Jasim, & Abdulla, 2017; Ivarsson, 2023). Educational practices need to adapt to the different ways these students learn, driving effective teaching that fosters their overall development and full integration into the school dynamic. This requires investment in ongoing teacher training and appropriate teaching resources, as well as the promotion of a supportive, collaborative environment throughout the school community. Only in this way can we ensure that every student, regardless of their particularities, has the opportunity to reach their full potential and make a positive contribution to society.

These students naturally display a wide range of individual characteristics, and this heterogeneity complicates the application of standardized educational strategies. In the context of truly inclusive education, gifted students fall into equally diverse groups, reinforcing the need for adapted educational approaches (Navarro et al., 2006). This means a need for different teaching practices that promote inclusion and recognition of these students (Oliveira, Alves, Moraes, & Oliveira, 2021; Rech, Negrini, & Santos, 2023), ensuring that everyone has access to learning opportunities that respect and value their unique characteristics. Educational practices need to adapt to the different ways these students learn, driving effective teaching that fosters their overall development and full integration into the school dynamic. This requires investment in ongoing teacher training and appropriate teaching resources, as well as the promotion of a supportive, collaborative environment throughout the school community. Only in this way can we ensure that every student, regardless of their particularities, has the opportunity to reach their full potential and make a positive contribution to society.

In other words, it is crucial that teachers are trained to act in relation to school inclusion for gifted students. We know that these students' skills are not properly identified, and their inclusion is not effective, meaning that teaching practices are not geared towards their real needs. If teachers are trained in this area, they find it easier to identify students with these characteristics and plan inclusive teaching practices (Martins, Chacon, & Almeida, 2020; Scanlon, Radeva, Pitsia, Maguire, & Nikolaeva, 2022). Teachers must understand the characteristics of gifted students to identify them, stimulate their skills, and contribute to the development of their identities (Rech & Negrini, 2019). In addition, this initial and ongoing training must empower teachers to help their future students in creative practices, since good teacher mediators who understand the reality of gifted students will also have the skills to develop their students' creative potential (Piske et al., 2017). This means that teacher training is a key element in promoting inclusive, quality education, ensuring that all students, regardless of their needs, can reach their full potential.

Having moved away from the perception of a traditional school, focused solely on the conventional function of mass teaching and ignoring students' particularities and interests, it is becoming increasingly essential to ensure not only knowledge of the educational policies and legislation that underpin the principle of inclusive education but also how to apply them effectively in practice. We are thus faced with fundamental educational policies that translate into specific measures (Cross & Cross, 2005) seeking to meet the individual needs of each student, while also considering families and ensuring suitable professional conditions for teachers to provide an effective educational response, respecting individual differences and serving everyone (Klimecká, 2023; Martins et al., 2020).

In Portugal, the legislation establishing the legal framework for inclusive education was approved in 2018 through Decree-Law 54/2018 from the Ministry of Education of Portugal (2018a). This document is fundamental in promoting inclusive schooling that seeks to include all students, ensuring appropriate responses for each child and protecting universal access to education and training. Implementation of this legislation requires continuous commitment from all educational agents, ensuring that each student has the opportunity to develop their potential in an environment of mutual respect and support (Antunes et al., 2020). Despite Decree-Law no. 54/2018 (Ministry of Education of Portugal, 2018a) not referring to specific measures for gifted students, the concept of inclusion is defined as a political priority that ensures students' rights to an "inclusive education that responds to their potential, expectations, and needs within the framework of a common and plural educational project that provides everyone with participation and a sense of belonging in effective conditions of equity, thus contributing decisively to higher levels of social cohesion" (Ministry of Education of Portugal, 2018a).

This recognizes an effort to include everyone considering their differences, regardless of whether those differences are talents/strengths or Specific Educational Needs based on the skills profiles established in the Profile of Students Leaving Compulsory Schooling (Portuguese Ministry of Education, 2017). This profile establishes a set of essential skills that all students must develop during their schooling, promoting an education that values comprehensive development and preparation for active civic life.

In the Portuguese educational context, the legislation provides for various situations that allow for flexibility in students' schooling, especially when they demonstrate exceptional abilities in certain areas. This legal framework seeks to ensure individualized education tailored to students' individual needs, thus promoting greater effectiveness in the learning process. Normative Order No. 10-B/2021, April 14th, addresses the possibility of early schooling in the 1st year of the 1st cycle of basic education in exceptional circumstances (Portuguese Ministry of Education, 2021). This measure allows children to be enrolled early, at a parent or guardian's request and with the authorization of the member of the government responsible for education, adapting their schooling to their needs and abilities.

Ordinance 223-A/2018, August 3rd, contains specific provisions for special cases of progression in compulsory education (Ministry of Education of Portugal, 2018b). This legislation stipulates that students with exceptional ability and who are suitably mature can, under certain conditions, complete the first cycle at the age of nine or move up a year before the end of the school year. This may happen in two ways: a) completing the first cycle at the age of nine, completed by December 31st of the respective year, allowing the first cycle to be completed in three (rather than four) years; b) moving up from one school year to the next before the end of the school year, once only, during the second and third cycles.

In addition, Decree-Law 344/90 emphasizes artistic education and the importance of identifying students with specific talents in this area (Portuguese Ministry of Education, 1990). This decree recognizes the importance of making it possible for students who are artistically gifted and precocious in this area to attend higher education in this field, even if they do not have the traditionally required academic qualifications. This legal framework underlines the importance of specialized, adapted training, ensuring that these students can fully develop their talents and skills.

Although Portuguese legislation establishes measures to tailor teaching to each student's particular characteristics, effective implementation is often constrained by teachers' lack of adequate knowledge and training. This gap highlights the urgent need to invest in ongoing training programs for teachers and other educational agents

so that they can properly identify and support students with different educational needs, including those with exceptional abilities. The legal provisions, which seek to provide flexible educational pathways and promote the development of individual potential, require wider dissemination and specialized training to be effectively applied. All educational agents need to know and understand these measures in order to ensure that each student's individuality is recognized and appreciated in the educational process. To that end, there needs to be investment in teachers' ongoing training and the provision of adequate resources to enable effective implementation of educational policies. In addition, school cultures need to be promoted that value diversity and promote inclusion, ensuring that all students regardless of their characteristics and potential have access to learning opportunities that stimulate them and develop their skills. Only in this way will it be possible to fully achieve the goals of inclusive, equitable education that respects and values each individual, contributing to building a fairer, more cohesive society.

It is important to note that in the context of inclusive schools, Decree-Law 55/2018 (Ministry of Education of Portugal, 2018c) has promoted flexibility and curricular autonomy. The Portuguese government encouraging schools to adopt this project underlines its essential importance. There is a renewed commitment, not only to the autonomy of educational institutions but also to ongoing professional training, which is essential for improving the skills needed to implement inclusive educational practices.

In accordance with this framework, the education policy in the Autonomous Region of Madeira includes specific legislation aimed at gifted, potentially gifted, or talented students, promoting research and implementation of specific intervention strategies. This approach includes measures for early schooling and progression, enrichment activities, and other appropriate programs, in accordance with current legislation. These measures are based on Regional Legislative Decree no. 33/2009/M, of December 31st, specifically Article 40, which establishes support for gifted students. Furthermore, these provisions must be widely disseminated and accompanied by specialized training, ensuring effective application and the recognition of each student's individual needs (Sayi, 2018; Swanson, Brock, Van Sickle, Gutshall, & Curby, 2022). This is the only way to guarantee inclusive, equitable education that values diversity and promotes students' all-round development (Wray, Sharma, & Subban, 2022).

In the context of gifted students' educational inclusion, academic training and specific training in giftedness are fundamental variables, since they directly influence teachers' pedagogical effectiveness in dealing with this group. Academic training reflects teachers' levels of theoretical and practical exposure to pedagogical concepts and strategies, and higher levels of training have been shown to be associated with greater ability to respond to various educational needs (Aslan & Yurtal, 2023; Baudson & Preckel, 2016). In turn, specific training in giftedness is essential for the development of pedagogical skills that enable early identification and effective support for gifted students, as shown in recent studies (Cheung, Shek, Hui, Leung, & Cheung, 2022).

The aim of this study is to examine teachers' knowledge and perceptions about the education of gifted students in Portugal. This approach could allow the identification of strengths and weaknesses regarding the promotion of these students' educational inclusion and the extrapolation of aspects that should be included in teacher training.

2. METHOD

The study used a quantitative, descriptive, ex post facto research methodology.

2.1. Participants

The data was collected from non-university teachers in Portugal. Based on a stratified random sampling method using the gender of the participants as a stratum (according to lists provided by participating school administrations), 863 teachers were selected after expressing interest in participating in the study. The distribution of the sample by educational attainment was as follows: Post-Graduate (Teaching Diploma), 92 or 10.66%; Bachelor's Degree, 544 or 63.04%; Master's, 195 or 22.59%; Doctorate, 23 or 2.67%; and Other, 9 or 1.04% (this includes Post-Doctorate and Specialized Training Courses). The vast majority, 812 or 94.09%, had no specific training in giftedness, whereas 51

or 5.91% had specific training. Around a fifth of the subjects, 183 or 21.21%, were men and 680 or 78.79% were women. In terms of teaching experience: 36 or 4.17% had five years' experience or less; 86 or 9.96% had from six to fifteen years; 258 or 29.90% from sixteen to twenty-five years; 366 or 42.41% from twenty-six to thirty-five years; and 117 or 13.56% had more than thirty-five years' experience.

2.2. Procedure

The instrument was created and administered between November 2022 and April 2023. A letter explaining the study was sent to Portuguese schools. The study was conducted in strict compliance with fundamental ethical principles. Participation was voluntary, and participants' anonymity was ensured. The procedures complied with the ethical standards in force in Portugal for studies conducted with adults. Clear, explicit informed consent was obtained, and all participants were adequately informed about the objectives, procedures, expected benefits, and possible drawbacks or risks associated with the study. In addition, written authorization was also obtained from the schools where the participating teachers worked. This process underscores the commitment to best ethical practices in scientific research.

The study was approved by the Technical-Scientific Council of the *Superior Institute of Educational Sciences of the Douro* (ISCE Douro, Portugal) at a meeting held on September 13, 2022. The project, *entitled Interdisciplinary Studies in Psychology and Education: Models of Human Development in Educational and Social Contexts* (Code AR.130924), was evaluated and approved, ensuring compliance with applicable ethical principles.

2.3. Instrument

There is a need for a specific instrument to assess teachers' perceptions and knowledge about the education of gifted students (CPD-ACI), particularly in the Portuguese educational context. Although there are similar instruments in the international literature, such as the *Teacher Perceptions about Gifted Students Questionnaire* (García-Barrera et al., 2021) and the *Questionnaire for Gifted Education* (Brausewetter, 2023), they were designed for different legislative, cultural, and pedagogical frameworks, which limits their applicability to the Portuguese education system. In particular, the existing instruments do not adequately consider the national legislative framework, including Decree-Law 54/2018, which regulates inclusive education in Portugal.

The instrument developed for this study was designed based on recognized theoretical models, such as *Renzulli's Three Rings Model and Gagne's Differentiated Talent Model*, which guided the definition of the dimensions and items assessed. The dimensions – conceptualization, legislation, identification, and intervention reflect the need to combine theoretical, practical, and legislative knowledge, essential elements for training teachers to identify and support gifted students.

The instrument was created in accordance with the central aim of the study, allowing the identification of specific gaps in teachers' knowledge, especially related to the practical application of pedagogical strategies and understanding the national legislative framework. This approach is supported by recent research highlighting the importance of scales adapted to the local context for the development of effective teacher training (Aslan & Yurtal, 2023; Cheung et al., 2022).

The instrument created for the study consists of 26 items across four dimensions: Conceptualization (items 1-8), Legislation (items 9-14), Identification (items 15-20), and Intervention (items 21-26). Additionally, the instrument includes a section for observations, allowing participants to add any relevant information not covered by the items. Responses to each item are provided on a Likert-type scale: Strongly disagree (1), Disagree (2), Neither agree nor disagree (3), Agree (4), and Strongly agree (5). The minimum possible score is 26, and the maximum is 130. The questionnaire is structured as follows (Table 1).

Table 1. Structure of the instrument.

Conceptualization (C)	1. I know what a gifted student is. 2. I know the types of profiles within giftedness. 3. I know the prevalence of giftedness in schools. 4. When I had a gifted student in the classroom, I knew what his/her main characteristics were. 5. At school, we have maintained communication with associations and specialists who serve the needs of gifted students in order to increase knowledge about them. 6. I am able to help and guide a fellow teacher in relation to gifted students. 7. In my initial training, I had the opportunity to come into contact with the subject of giftedness. 8. In continuing education, I have had the opportunity to update my knowledge in the field of giftedness.
Legislation (L)	9. I am familiar with Portuguese legislation regarding inclusion and attention to diversity. 10. I am familiar with the content of Portuguese legislation for students with exceptional learning abilities. 11. I am familiar with the content of Portuguese legislation concerning students with specific aptitudes or talents in a particular artistic area. 12. I apply Decree-Law no. 54/2018, the legal regime of inclusive education, for pupils/students with gifted characteristics. 13. I understand the importance of existing specific legislation that seeks educational responses for gifted students from the perspective of educational inclusion. 14. In my educational practice, I consider inclusive education fundamental, so its principles must be applied in the classroom for all students.
Identification (ID)	15. I know the characteristics that a potentially gifted student may present. 16. I try to be aware of already identified cases in order to respond to the learning needs of each gifted student. 17. I am familiar with identification instruments for gifted students. 18. I consider the relationship between the school and the family to be fundamental for identification and proper education for gifted students. 19. In the process of identification and education, I believe it is important to ask associations/Specialists who support gifted students to collaborate. 20. I am aware of the need for teacher training to identify and educate gifted and/or talented students.
Intervention (IN)	21. I have, or have had, a gifted student in my classroom. 22. I believe that the family-school relationship is fundamental for proper intervention with gifted students. 23. In the process of educational intervention, it is important to seek collaboration from associations and specialists who work with gifted students. 24. I am familiar with educational measures/pedagogical strategies to be implemented with gifted students. 25. I implement educational measures/Pedagogical strategies for gifted learners. 26. I am aware of the need for teacher training to better address the characteristics of gifted students.
Observations	27. The instrument includes an observations section, allowing participants to provide any relevant information not covered by the structured items.

Note: All items are measured using a five-point Likert-type scale (1 = Strongly disagree; 2 = Disagree; 3 = Neither agree nor disagree; 4 = Agree; 5 = Strongly agree). The minimum possible score is 26 and the maximum possible score is 130.

The reliability of the instrument via Cronbach's Alpha was 0.93. The indices by dimension were Conceptualization = 0.78; Legislation = 0.78; Identification = 0.77; and Intervention = 0.76. An expert panel of five specialists in inclusion and giftedness, with extensive training and experience in these subjects, reviewed the items. This review yielded the following content validity indexes: Conceptualization 0.95, Legislation 0.85, Diagnosis 0.90, Intervention 0.90, and Total 0.90. A Kappa index of 0.86 was obtained. Finally, exploratory factor analysis produced the following results: KMO 0.93, Bartlett's sphericity test index 14,433.64, and $p < 0.001$. The percentage of total variance explained was 62.93%, and a factor structure similar to the initial four-factor design was identified, with the following factor loadings (Table 2).

Table 2. Factorial loadings for instrument items.

Items	Factors			
	1	2	3	4
I1	0.43			
I2	0.75			
I3	0.77			
I4	0.50		0.57	
I5	0.68			
I6	0.76			
I7	0.60			
I8	0.69			
I9				0.78
I10				0.74
I11				0.71
I12				0.52
I13				0.65
I14				0.64
I15	0.53		0.46	
I16	0.46		0.43	
I17			0.71	
I18			0.76	
I19			0.84	
I20			0.80	
I21		0.80		
I22		0.86		
I23		0.85		
I24	0.56	0.52		
I25		0.74		
I26		0.74		

According to confirmatory factor analysis, the items and their respective latent variables or dimensions demonstrated satisfactory fit, meeting the goodness-of-fit indices reported by the model: $\chi 2$= 187.04, p= 0.07, RMSEA= 0.05, TLI= 0.89, CFI= 0.90, GFI= 0.90. Nevertheless, data from a new application of the instrument are needed to confirm these indices, which is included as a suggestion for future research.

2.4. Data Analysis

Once the data were collected, the following statistics were calculated: minimum, maximum, mean, standard deviation, skewness, and kurtosis. Normality analysis using the Kolmogorov-Smirnov test showed that the data followed a normal distribution, indicating that parametric statistics, Student's t-test, and ANOVA were appropriate for data analysis. Finally, a MANOVA was performed to examine the statistical significance of the effects between the independent variables educational attainment and specific training in giftedness, and the dependent variable results in the instrument. Statistical analysis was conducted using SPSS version 28.0 (IBM Corporation, Armonk, NY, USA), with a confidence level of 95%.

3. RESULTS

The results are organized into four parts: descriptive statistics for the instrument items and dimensions, results based on whether teachers had specific training in giftedness, results based on teachers' educational attainment, and results based on these two training-related variables according to the results from the instrument (MANOVA). Firstly, the descriptive statistics for the instrument items and dimensions were as follows (Table 3).

Table 3. Descriptive statistics of the instrument items and dimensions.

Items/ Dimensions	Minimum	Maximum	M	SD	Skewness	Kurtosis
I1	1	5	3.81	0.88	-0.70	0.61
I2	1	5	2.71	1.11	0.11	-0.74
I3	1	5	2.35	1.04	0.36	-0.55
I4	1	5	2.90	1.16	-0.14	-0.73
I5	1	5	2.26	1.14	0.46	-0.69
I6	1	5	2.44	1.16	0.28	-0.90
I7	1	5	1.95	1.16	1.03	0.05
I8	1	5	2.21	1.19	0.68	-0.54
I9	1	5	3.37	1.33	-0.46	-0.94
I10	1	5	2.64	1.21	0.23	-0.89
I11	1	5	2.52	1.15	0.28	-0.80
I12	1	5	2.95	1.24	-0.06	-0.83
I13	1	5	4.26	0.89	-1.37	2.06
I14	1	5	4.40	0.84	-1.56	2.61
I15	1	5	3.27	1.06	-0.41	-0.35
I16	1	5	3.29	1.11	-0.43	-0.35
I17	1	5	2.41	1.07	0.25	-0.69
I18	1	5	4.40	0.78	-1.42	2.31
I19	1	5	4.43	0.76	-1.51	3.07
I20	1	5	4.41	0.77	-1.38	2.16
I21	1	5	2.42	1.50	0.50	-1.26
I22	1	5	4.56	0.68	-1.88	4.96
I23	1	5	4.48	0.72	-1.62	3.50
I24	1	5	2.82	1.16	-0.06	-0.87
I25	1	5	2.64	1.24	0.12	-0.96
I26	1	5	4.42	0.81	-10.72	3.66
C	8	40	20.63	6.38	0.32	-0.27
L	6	30	20.14	4.86	-0.02	-0.35
ID	6	30	22.21	3.76	-0.37	0.66
IN	6	30	21.34	4.08	-0.01	0.19
Total	32	130	84.32	16.53	0.18	-0.04

The highest mean scores were in items 22 (M= 4.56; SD= 0.68), 23 (M= 4.48; SD= 0.72), and 19 (M= 4.43; SD= 0.76). The participating teachers were aware of the importance of collaboration with associations and specialists in both identification and educational intervention for these students, as well as the need to involve families to provide appropriate education. In contrast, the lowest mean scores were in items 7 (M= 1.95; SD= 1.16), 8 (M= 2.21; SD= 1.19), and 5 (M= 2.26; SD= 1.14). The first two items relate to initial and ongoing teacher training, indicating that participants identified a lack of training regarding giftedness at these stages. Item 5 is noteworthy because, although teachers considered coordination with associations and specialists essential for proper detection and education, communication in everyday educational practice was insufficient.

The results from the Conceptualization dimension are notable because, although it has two more items than the other three dimensions, it had lower mean scores than the Identification and Intervention dimensions. This indicates a need to generalize training processes aimed at both trainee and in-service teachers, since the participating teachers felt that both their initial and ongoing training needed improvement, emphasizing the necessity for a multidimensional approach: characteristics, types, prevalence, educational needs, and stereotypes. Education authorities must address this need and ensure the widespread allocation of specific resources and coordination with associations and specialists to provide suitable socio-educational treatment for these children. The dimension with the highest scores was Identification (M= 22.21; SD= 3.76). Teachers recognize the importance of collaboration between school, family, and associations or specialists in the identification process. However, despite this dimension having the highest mean score, it is worth noting that item 17 received one of the lowest scores on the instrument

(M= 2.41; SD= 1.07). This item refers to teachers' lack of familiarity with instruments used for the identification process. The overall mean score for the instrument was 84.32 (SD= 16.53), with positive asymmetry (0.18) and negative or platykurtic kurtosis (-0.04).

The results were further examined based on two individual teacher variables: whether they had received specific training in giftedness and their educational attainment. Student's t-test yielded the following results regarding whether participants had received specific training in giftedness (Table 4).

Table 4. Student's t-test based on whether participants had received specific training in giftedness.

Items/ Dimensions	Specific training				*t*	p
	No		Yes			
	M	SD	M	SD		
I1	3.75	0.87	4.67	0.48	-7.40	<0.001
I2	2.61	1.06	4.29	0.73	-11.15	<0.001
I3	2.29	1.01	3.37	1.00	-7.40	<0.001
I4	2.83	1.14	4.00	0.98	-7.19	<0.001
I5	2.20	1.10	3.18	1.42	-6.05	<0.001
I6	2.34	1.09	4.10	0.78	-11.30	<0.001
I7	1.90	1.11	2.71	1.60	-4.86	<0.001
I8	2.10	1.10	3.98	1.10	-11.86	<0.001
I9	3.28	1.32	4.67	0.55	-7.42	<0.001
I10	2.55	1.17	4.10	0.88	-9.29	<0.001
I11	2.44	1.11	3.80	1.00	-8.57	<0.001
I12	2.88	1.21	4.18	1.03	-7.47	<0.001
I13	4.23	0.91	4.73	0.49	-3.88	<0.001
I14	4.37	0.85	4.80	0.40	-3.57	<0.001
I15	3.20	1.04	4.45	0.54	-8.54	<0.001
I16	3.23	1.10	4.29	0.76	-6.84	<0.001
I17	2.32	1.00	3.92	0.93	-11.10	<0.001
I18	4.38	0.80	4.82	0.38	-3.97	<0.001
I19	4.41	0.77	4.75	0.48	-3.13	0.002
I20	4.39	0.77	4.67	0.68	-2.47	0.014
I21	2.33	1.45	3.78	1.57	-6.89	<0.001
I22	4.54	0.69	4.84	0.37	-3.08	0.002
I23	4.46	0.74	4.75	0.44	-2.69	0.007
I24	2.73	1.12	4.31	0.68	-9.97	<0.001
I25	2.56	1.20	3.98	1.16	-8.23	<0.001
I26	4.40	0.82	4.80	0.45	-3.50	<0.001
C	20.02	5.94	30.29	5.18	-12.06	<0.001
L	19.75	4.69	26.27	3.14	-9.80	<0.001
ID	21.92	3.62	26.90	2.76	-9.66	<0.001
IN	21.02	3.91	26.47	3.25	-9.73	<0.001
Total	82.71	15.44	109.94	11.61	-12.37	<0.001

As Table 4 shows, there were statistically significant results in all items, dimensions, and in the total, with the majority of p-values less than .001. Participants completing the questionnaire who had received specific training in this topic scored higher on average. For example, in the Conceptualization dimension, the mean score for teachers who had received training was 30.29 (SD = 5.18), compared to 20.02 (SD = 5.94) for those who had not. In the Legislation dimension, trained teachers scored a mean of 26.27 (SD = 3.14), versus 19.75 (SD = 4.69) for untrained teachers. In the Identification dimension, trained teachers' mean score was 26.90 (SD = 2.76), compared to 21.92 (SD = 3.62) for non-trained teachers. In the Intervention dimension, the mean for those with training was 26.47 (SD = 3.25), versus 21.02 (SD = 3.91) for those without. Finally, the mean total score for teachers with training was 109.94 (SD = 11.61), compared to 82.71 (SD = 15.44) for those without. The effect sizes for the differences across the instrument as a whole were large (Cohen, 1988).

Table 5 shows the results of the ANOVA considering the other variable, the teachers' educational attainment. Several items were statistically significant: Items 9 and 24 had a p-value < 0.001; items 2, 6, 10, and 11 had a p-value < 0.01; and items 4, 7, 8, 13, and 21 had a p-value < 0.05. This significance mainly resulted from higher scores in the Doctorate category. There was also statistical significance in the four dimensions: $p < 0.001$ in Legislation and Intervention, $p < 0.01$ in Conceptualization, and $p < 0.05$ in Identification. With the exception of Conceptualization, where the highest scores were in the other category (Post-Doctorate and Specialized Training Courses), the highest scores were from the Doctorate category. This indicates that the higher the level of educational attainment, the greater the knowledge and understanding of giftedness and how to address it in terms of education. The instrument as a whole produced a p-value < 0.001, with the highest scores in the Doctorate category.

Table 5. ANOVA based on participants' educational attainment.

Items/ Dimensions	Educational attainment										*F*	p	Eta²	Direction
	Post-Graduation (1)		Bachelor's Degree (2)		Master's (3)		Doctorate (4)		Other (5)					
	M	SD	M	SD	M	SD	M	SD	M	SD				
I1	3.98	0.798	3.76	0.86	3.82	0.99	4.00	0.74	4.00	0.71	1.64	0.163	0.01	4.5>1>3>2
I2	2.89	1.11	2.62	1.06	2.83	1.21	3.13	1.36	3.33	0.87	3.66	0.006	0.02	5>4>1>3>2
I3	2.40	1.03	2.32	1.02	2.38	1.10	2.52	1.16	3.00	1.00	1.26	0.283	0.01	5>4>1>3>2
I4	3.10	1.13	2.81	1.14	2.97	1.20	3.17	1.37	3.44	0.88	2.43	0.046	0.01	5>4>1>3>2
I5	2.30	1.12	2.23	1.12	2.31	1.20	2.13	1.25	2.89	0.93	1.00	0.409	0.00	5>3>1>2>4
I6	2.73	1.19	2.34	1.09	2.53	1.26	2.91	1.41	2.56	1.01	3.87	0.004	0.02	4>1>5>3>2
I7	2.18	1.27	1.86	1.07	2.03	1.26	2.22	1.44	2.44	1.24	2.64	0.033	0.01	5>4>1>3>2
I8	2.43	1.29	2.10	1.09	2.37	1.31	2.48	1.50	2.44	1.13	3.35	0.010	0.01	4>5>1>3>2
I9	3.86	1.18	3.21	1.31	3.50	1.39	4.17	1.11	3.00	1.32	8.14	<0.001	0.04	4>1>3>2>5
I10	3.03	1.18	2.53	1.15	2.72	1.31	3.09	1.41	2.67	1.22	4.56	0.001	0.02	4>1>3>5>2
I11	2.88	1.11	2.41	1.07	2.57	1.28	2.96	1.49	2.78	1.20	4.54	0.001	0.02	4>1>5>3>2
I12	3.16	1.22	2.88	1.21	3.02	1.30	3.39	1.47	2.78	0.97	1.99	0.094	0.01	4>1>3>2>5
I13	4.48	0.76	4.22	0.88	4.21	1.00	4.70	0.47	4.22	0.67	3.18	0.013	0.01	4>1>5>2>3
I14	4.50	0.86	4.36	0.85	4.43	0.84	4.70	0.56	4.33	0.71	1.45	0.215	0.01	4>1>3>2>5
I15	3.45	0.96	3.20	1.05	3.35	1.10	3.65	1.11	3.22	0.97	2.30	0.057	0.01	4>1>3>5>2
I16	3.53	0.95	3.22	1.08	3.33	1.21	3.57	1.31	3.44	1.01	2.15	0.073	0.01	4>1>5>3>2
I17	2.55	0.99	2.36	1.02	2.44	1.21	2.83	1.07	2.89	0.60	2.13	0.075	0.01	5>4>1>3>2
I18	4.58	0.65	4.37	0.78	4.42	0.84	4.48	0.79	4.11	0.78	1.76	0.135	0.01	1>4>3>2>5
I19	4.52	0.64	4.41	0.76	4.41	0.83	4.57	0.51	4.11	0.78	1.01	0.401	0.00	4>1>2>3>5
I20	4.49	0.70	4.36	0.79	4.48	0.78	4.61	0.58	4.44	0.73	1.66	0.157	0.01	4>1>3>5>2
I21	2.62	1.52	2.30	1.43	2.65	1.63	2.48	1.65	2.56	1.59	2.44	0.045	0.01	3>1>5>4>2
I22	4.71	0.50	4.53	0.71	4.55	0.67	4.70	0.47	4.56	0.73	1.52	0.193	0.01	1>4>5>3>2
I23	4.60	0.63	4.47	0.74	4.45	0.73	4.70	0.47	4.44	0.73	1.29	0.274	0.01	4>1>2>3>5
I24	3.15	1.07	2.68	1.14	2.98	1.22	3.39	1.08	2.89	1.17	6.31	<0.001	0.03	4>1>3>5>2
I25	2.85	1.21	2.55	1.20	2.78	1.35	2.74	1.32	2.89	1.05	2.17	0.071	0.01	5>1>3>4>2
I26	4.60	0.66	4.38	0.84	4.44	0.81	4.52	0.59	4.44	0.73	1.61	0.169	0.01	1>4>5>3>2
C	22.02	6.53	20.03	5.99	21.24	6.98	22.57	7.98	24.11	5.37	3.99	0.003	0.02	5>4>1>3>2
L	21.91	4.62	19.61	4.58	20.45	5.41	23.00	4.96	19.78	3.90	7.05	<0.001	0.03	4>1>3>5>2
ID	23.12	2.98	21.92	3.60	22.44	4.37	23.70	4.06	22.22	2.82	3.29	0.011	0.01	4>1>3>5>2
IN	22.52	3.75	20.90	3.92	21.85	4.56	22.52	3.70	21.78	3.63	4.84	<0.001	0.02	4.1>3>5>2
Total	89.58	15.01	82.47	15.44	85.98	19.10	91.78	17.85	87.89	13.81	5.93	<0.001	0.03	4>1>5>3>2

Finally, a MANOVA was performed to relate the results in the questionnaire to the participants' educational attainment and specific training in giftedness. Based on Levene's test, homogeneity of variance was accepted. Pillai's trace was used to test the differences between variables (Table 6).

Table 6. Multivariate tests of specific training in giftedness, educational attainment, and interaction.

Effect	Pillai's trace	F	p	η 2 partial
Specific training in giftedness	0.086	20.041	<0.001	0.086
Educational attainment	0.018	0.969	0.488	0.005
Interaction	0.017	1.180	0.291	0.006

As Table 6 shows, Pillai's trace was only significant for the variable specific training in giftedness, $p < 0.001$, with a medium effect size. Given that there was a significant effect in this variable, Table 7 presents the univariate values for each of the dimensions considered. All dimensions were significant, $p < 0.001$, with medium effect sizes, especially in the Conceptualization dimension with a value of 0.078.

Table 7. Univariate contrasts for dimensions.

Dimensions	Mean square	F	p	η 2 partial
Conceptualization	2516.718	72.656	<0.001	0.078
Legislation	718.147	34.413	<0.001	0.039
Identification	514.882	40.607	<0.001	0.045
Intervention	744.920	50.055	<0.001	0.055
Total	16116.148	70.276	<0.001	0.076

4. DISCUSSION

Inclusion of gifted students is fundamental in the Portuguese educational system, requiring the development and application of pedagogical policies and practices that effectively respond to this specific group's needs. The analysis in the present study focused on Portuguese teacher training aimed at meeting these needs, while also highlighting the potential and limitations of the educational system in promoting an inclusive education strategy. This strategy must include all students not just those with learning difficulties to ensure truly democratic schooling.

There were significant differences in all the dimensions analyzed (p-values < 0.001) in teachers' perceptions and knowledge of giftedness based on whether they had received specific training in giftedness. These differences were particularly evident in the conceptualization and legislation dimensions, where participants with specific training had higher mean scores. This is consistent with previous research highlighting the positive relationship between specialized training and pedagogical effectiveness in supporting gifted students (Aboud, 2023; Aslan & Yurtal, 2023).

Looking at educational attainment, teachers with PhDs had higher scores in all dimensions, although the results in the legislation dimension are worth highlighting (p <0.001), where they exhibited greater familiarity with legal frameworks and their practical application. This suggests that greater educational attainment contributes to a deeper understanding of regulatory frameworks and being better able to implement them effectively. These results reinforce the need to promote initial and ongoing training that includes practical and specific components, in line with international studies that highlight the importance of professional development in the context of gifted education (Cheung et al., 2022).

Despite the solid legislative framework in Portugal, the data suggest that the implementation of these measures remains inconsistent, reflecting gaps in initial training and in the provision of ongoing training (Miranda, 2023). These limitations are not exclusive to the Portuguese context; they have also been identified in other international education systems, as demonstrated by Kalobo and Setlalentoa (2024). The results underline the importance of strengthening in-service training policies and disseminating good educational practices, creating an inclusive,

equitable learning environment that values the diversity and talents of all students (Uzunboylu, Akçamete, Sarp, & Demirok, 2022).

In Portugal, several laws promote inclusive education. These include Decree-Law No. 54/2018 (Ministry of Education of Portugal, 2018a) and 55/2018 (Ministry of Education of Portugal, 2018c) as well as Normative Order No. 10-B/2021 (Portuguese Ministry of Education, 2021) and Ordinance No. 223-A/2018 (Ministry of Education of Portugal, 2018b). This legislation establishes a legal framework that aims to ensure that all students, regardless of their individual characteristics, have access to quality education that is tailored to their specific needs. However, effective implementation of these policies requires teachers to have continued, specialized training, enabling them to identify and respond appropriately to the needs of gifted students. Investment is required in teachers' training to give them the tools and knowledge they need to implement inclusive pedagogical practices that value diversity and promote all students' comprehensive development. Only in this way will it be possible to fully achieve the objectives of inclusive, equitable education, contributing to the construction of a fairer, more cohesive society.

These legislative provisions aim to ensure a personalized, inclusive approach to each student's needs, reinforcing equal access and learning opportunities. Particular emphasis is placed on the response that the school can provide to all students, and the legislation places high value on measures to support learning and inclusion through guidelines based on universal design and a multi-level approach, which aim to adapt to each student's needs and potential (Antunes et al., 2020). However, despite the legal framework, the effective application of these legislative measures appears to be uneven, highlighting the importance of more consistent and effective implementation throughout the country. This consistency is essential to ensure that all students benefit from a truly inclusive and enriching educational environment.

Achieving this requires continuous investment in training teachers and other education professionals, equipping them with the skills and tools they need to identify and appropriately cater to diverse student needs. Furthermore, the creation of mechanisms for monitoring and evaluating educational practices must be reinforced, ensuring that inclusive policies are applied consistently and effectively in all schools. Rigorous, consistent implementation of legislative measures will allow all students to be given a quality education that values diversity and promotes each individual's overall development. This will contribute to the construction of a fairer, more cohesive society.

Portuguese teachers are well aware of the importance of associations, specialists, and families in the educational response to gifted students (Belur & Oguz-Duran, 2017; Peebles, Mendaglio, & McCowan, 2023). However, coordination with these actors can still be improved. Teachers appear capable of collaborating in identifying these students (Akgül, 2021) but recognize weaknesses in how giftedness is conceptualized (Tourón, 2020; Tourón, Navarro-Asencio, & Tourón, 2023) as well as the existence of certain prejudices and stereotypes (Biber et al., 2021; Parra, García, & Ruiz, 2020; Matheis, Keller, Kronborg, Schmitt, & Preckel, 2020).

Furthermore, they have highlighted poor initial and ongoing training (Barrera-Algarín, Sarasola-Sánchez-Serrano, Fernández-Reyes, & García-González, 2021; Gali, Fakhrutdinova, & Grigorieva, 2017; García-Barrera, Monge-López, & Gómez-Hernández, 2021) and feel that both types of training are essential for improving the understanding of these students' characteristics and needs (Aperribai & Garamendi, 2020; Baudson & Preckel, 2016; Torrente, Ruiz-Melero, & Sainz, 2022). They are aware that this weakness results in a lack of individualization and failure to tap students' true potential (Conejeros-Solar, Gómez-Arizaga, & Donoso-Osorio, 2013; Mendonça, Piazentin, Rolim Rodrigues, & Messias Fialho Capellini, 2020; Reis & Renzulli, 2010). To overcome these challenges, both initial and ongoing teacher training need to be reinforced. Teachers must have the tools and knowledge they need to identify and effectively support gifted students. Close collaboration between schools, associations/specialists, and families must be promoted, creating an educational environment that values and enhances each student's individual abilities (Golle, Schils, Borghans, & Rose, 2023; Shore, 2021).

To ensure that gifted students receive an adequate educational response, there needs to be a concerted effort that includes adequate training for teachers, the elimination of prejudices and stereotypes, and better coordination among

all those involved in the educational process. This will allow students to receive an education that recognizes and values their unique characteristics, promoting their overall development (Baccassino & Pinnelli, 2023; Duckworth et al., 2021). One way to underscore the importance of this training is to reiterate that in our study, teachers with greater educational attainment (Doctorate, Post-Doctorate, or Specialized Training Courses) had higher average scores than teachers with lower qualifications. These differences were statistically significant in all four dimensions and in the instrument total. Teachers who had received specific training in giftedness also had higher mean scores, differences that were statistically significant in all of the instrument items and dimensions. This is logical but notable due to the large effect sizes. Finally, the multivariate analysis indicated high statistical significance, and participants with higher education who had also received specific training in giftedness had higher mean scores.

One limitation that would have been interesting to address is that the study did not consider the type of training in giftedness or participants' workloads. Another question to consider in this regard is whether, despite having had training, teachers felt sufficiently prepared to deal with gifted students in an educational context. There is research on this (e.g., Monzó-Martínez and García-Raga (2024)). Future research seeking to replicate the results will also address these limitations and will use confirmatory factor analysis with a new sample of teachers to analyze the persistence of the underlying structure in the instrument, as well as incorporate other teaching variables into the analysis, such as age (e.g., Monzó-Martínez and García-Raga (2024)), gender (e.g., García-Perales, Ferrando Prieto, María Sáez-Gallego, and León (2024)), and teaching experience (e.g., Kaskaloglu-Almulla (2022)).

Ultimately, our study reiterates the importance of specialized, continued training for teachers as an essential pillar for creating an inclusive educational environment that can effectively respond to all students' needs. The importance of teacher training in the context of giftedness is clear, both in initial and ongoing training, to ensure teachers progress throughout their careers. In order to provide suitable education for these students, teachers must have an appropriate professional profile (Mahfouz, 2015) along with suitable attitudes towards educating these children (Barrenetxea-Mínguez, Galindo-Domínguez, & Yániz-Álvarez-de-Eulate, 2024; Labrador, 2021; Morán, Delgado, Labrador, & Fernández, 2021).

It is from this perspective that we want all teachers to have specialized training—especially with regard to dimensions related to the identification of and intervention for students with high intellectual abilities—so that each teacher can: (i) understand these students' characteristics; (ii) respond to their learning needs; (iii) understand the instruments used to identify these students; (iv) meet with associations/specialists that support gifted students; and (v) understand and implement appropriate educational measures and pedagogical strategies for these students (García-Perales et al., 2024). Furthermore, several studies have demonstrated the effectiveness of continued and specialized training in implementing differentiated educational practices, improving the quality of education for gifted students (Dijkstra, Walraven, Mooij, & Kirschner, 2016; Feuchter & Preckel, 2022; Peters & Jolly, 2018).

5. CONCLUSION

The study demonstrated that specific training in giftedness has a positive influence on teachers' pedagogical practices. However, there is a significant challenge in terms of teachers' lack of knowledge and adequate training, which limits the full integration of these students and appreciation of their abilities in the school context. This gap highlights the need to reinforce teachers' ongoing training, encouraging the development of tailored pedagogical strategies that not only recognize but also promote gifted students' potential (Rocha, García-Perales, Almeida, & Silva, 2022b).

Teachers must understand how important their role is in this area and invest in technical skills, including the use of technology with these students (Yu & Jen, 2020). Teachers and other education professionals need spaces for their training that address different ways of organizing work in schools, effectively contributing to inclusive educational practices in the context of giftedness (Silva & Souza, 2022). This focus on specialized training is essential

to ensure that educators are prepared to respond to students' varied needs (Rivera, 2022), promoting high-quality inclusive learning.

Ongoing training must also include practical components that allow teachers to directly apply what they have learned to their classrooms, helping them to develop pedagogical methods that encourage gifted students' creativity and critical thinking. Collaboration between schools, specialist associations, and families is equally vital for creating an educational environment that values and enhances each student's individual abilities (Golle et al., 2023; Shore, 2021).

Several other studies have also highlighted the effectiveness of continued, specialized training in implementing differentiated educational practices. For example, Feuchter and Preckel (2022) demonstrated that implementing full-time ability grouping can significantly reduce boredom in gifted students by promoting a more engaging learning environment tailored to their specific needs. Deunk, Smale-Jacobse, de Boer, Doolaard, and Bosker (2018) confirmed the effectiveness of differentiation practices in improving students' cognitive outcomes, while Gibbs and McKay (2021) analyzed teachers' differentiated teaching practices, highlighting challenges and effective strategies for meeting students' needs.

Finally, it is important to emphasize that, despite significant legislative advances in Portugal, continued efforts are needed to improve how these policies are put into practice in schools. Teacher training must be seen as a strategic priority to ensure that all students, including gifted students, have access to quality education that promotes their overall development. The effectiveness of these policies largely depends on educators' continued training, giving them the tools and knowledge they need to recognize and support students' diverse needs. An integrated approach focused on continued training is the only way to ensure inclusive, equitable education that values gifted students, helps develop their abilities, and addresses their needs.

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Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
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